IEEE GRID

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SCV/SSC

The High-Voltage Sub-Micron CMOS Technology Challenge

The full title of the presentation for the May 18 meeting of the Solid State Circuits Society is "The High-Voltage Sub-Micron CMOS Technology Challenge -or- Pushing the Maximum Operating Voltage Limits of a Sub-micron CMOS Technology: the Challenges Faced by the Design Engineer, Process Technologist, and Semiconductor Foundry." Navraj S. Nandra of Austria Mikro Systeme International Inc. is the speaker.

With Standard CMOS technologies, device size shrinks require reduction in supply voltages. Yet, a wide range of useful devices are required to work with voltages up to 50V. These applications include power management, liquid crystal display (LCD) drivers, automotive electronics, motion control (brushless DC motor controllers) and micro electro-mechanical (MEM's) IC's.

The problems faced in this quest and process and design techniques that can be used to achieve these capabilities will be the subject of the pre- [redacted] creasing the maximum operating voltage from 3.3V to 50V is by extending the vertical length and doping concentration of the n-well at the drain region of a MOS transistor. Specifically, a high voltage NMOS transistor can be realized when the heavily doped nplus drain is surrounded by an nminus drain extension. A similar approach is used for low voltage CMOS in LDD devices and a comparison of these technologies will be made.

The drain extension increases the avalanche breakdown voltage of the drain junction because the depletion region is allowed to penetrate the channel extended drain well. The drain extension reduces the channel electric field, by increasing the channel resistance, thereby increasing the drain to source breakdown voltage.

The extended drain well has a number of effects on the NMOS transistor. Firstly, the lateral series resistance reduces the transconductance [redacted] Secondly, there is an increase in the [redacted] (Rdson) and a reduction in the drain capacitance.

These breakdown mechanisms are not only limited to the drain region. If the gate of the CMOS transistor is biased beyond the rated supply, the oxide will at first degrade by hot-carriers, and then break down. Typical gate oxides can withstand electric fields in the region of 1V/nm. This is not the maximum allowable voltage; the maximum is determined by the quality of the oxide. Increasing the thickness of the oxide will allow higher gate voltages but will impact on the speed of the transistor.

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OEB/NPS

Characteristics and Applications of Gyrodevices

Monica Banks, Communications and Power Systems, formerly Varian, will be the featured speaker for the May 17 meeting of the Oakland/East Bay Nuclear & Plasma Sciences Society. Her topic is gyrodevices.

Gyrodevices are currently being developed for variety of applications where high power levels are required at millimeter wave frequencies. Gyrodevices, also know as cyclotron resonance masers or gyrotrons, take advantage of the cyclotron resonance maser instability to transfer energy from an electron beam to an electromagnetic wave. In the interaction, an annular electron beam, composed of mildly relativistic electrons traveling in helical paths, interacts with the electromagnetic fields of a circuit or cavity in the presence of an applied axial magnetic field.

One important way in which gyrodevices differ from conventional microwave devices, such as klystrons or helix traveling-wave-tubes, is that the phase velocity of the electromagnetic wave in a gyrodevice is equal to or greater than the speed of light. Devices such as gyrotrons, exhibiting this characteristic, are known as "fast-wave" devices.

In cyclotron resonance masers, the synchronism between the electron beam electromagnetic fields of the circuit is achieved by choosing the applied magnetic field such that the cyclotron frequency of the electrons is nearly equal to the desired microwave frequency of the device. The benefits of gyrodevices are derived from the combination of the cyclotron resonance interaction and the fast-wave interaction circuit.

In fast-wave circuits, the electromagnetic field strength can be quite high, independent of the proximity of the metallic circuit structure. This enables the electron beam to be situated in regions of high field, for optimum coupling, without necessarily placing the beam too close to the circuit. The interaction mode is selected by the magnitude of the applied magnetic field, which determines the electron cyclotron frequency, and the placement of the electron beam. If one makes use of a high-order waveguide or cavity mode, the transverse dimensions of the interaction structure can be several times the free-space wavelength.

On the contrary, in traditional slow-wave devices, the interaction circuits are designed to reduce the phase velocity of the electromagnetic wave to values below the speed of light so that synchronism between the beam and wave can be maintained. The electric field strength falls off rapidly with distance from the circuit structure. Typical transverse circuit dimensions required to effectively slow the phase velocity of the wave are on the order of 10% of the free space wavelength. The small circuit sizes, necessary to achieve the interaction in a slow-wave device, severely limit the peak and average power capabilities, particularly at millimeter wave frequencies.

The cyclotron maser interaction has been used to produce high-power millimeter waves in a both oscillator and amplifier configurations. Gyrotron oscillators, developed primarily for fusion applications, have achieved power levels near 1 MW for pulse durations in excess of 1 second at frequencies above 100 GHz. Gyrotron amplifiers are being developed for applications requiring phase coherence and instantaneous bandwidth, such as linear accelerators and millimeter wave radar. Recent successful demonstrations of gyroklystron amplifiers from X-band to W-band suggest the promise of these devices.

Monica Blank received the BS degree in electrical engineering from the Catholic University of America, Washington, D.C. in 1988, and the MS and PhD degrees, also in electrical engineering, in 1991 and 1994, respectively, from the Massachusetts Institute of Technology, Cambridge, where her dissertation work involved theoretical and experimental studies of quasi-optical mode converters for high power gyrotron oscillators.

In 1994 she joined the Vacuum Electronics Branch of the Naval Research Laboratory, where she was responsible for the design and demonstration of high-power millimeter wave vacuum electronic devices for radar applications. In 1999 she joined the gyrotron team at Communications and Power Industries (formerly Varian) where she continues her work on high-power millimeter wave gyrotron amplifiers and oscillators.

SCV PES/IAS

Annual Year-end Dinner Chapagne Celebration

The Santa Clara Valley combined chapter of the Industry Applications and Power Engineering Societies will hold its annual end-of-the-year dinner celebration at the beautiful Mirassou Champagne Cellars in the hills above Los Gatos.

This year the event will be held Friday, June 2 and will begin with wine tasting and hors d' oeuvres at 6:30 p.m. This will be followed by a true gourmet dinner at 7:00 prepared and served by an outstanding caterer, Dinner by Dana.

The historic Mirassou Champagne Cellars are located in Los Gatos at the old Novitiate Winery site. Those traveling south on Highway 17, take the East Los Gatos exit and go east about two blocks to the end of the Saratoga-Los Gatos Road which is Los Gatos Blvd. Turn right on Los Gatos Blvd. Which becomes East Main Street and follow it past the Los Gatos Civic Center to College Avenue which enters on your left at a stop sign. Follow College up the hill to the Mirassou site (it is signed).

IEEE GRID

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IEEE Grid is the monthly newspaper of the San Francisco Bay Area Council of the Institute of Electrical and Electronics Engineers, Inc. As a medium for both news and opinion, the editorial objectives of IEEE Grid are to inform readers in a timely and objective manner of newsworthy IEEE activities taking place in and around the Bay Area; to publish the official calendar of events; to report on IEEE activities on a national and international scope; and to serve as a forum for comment on areas of concern to the engineering community by publishing contributed articles, invited editorials and letters to the editor.

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Harry Gill to Receive IBM Corporate Award

Dr. Harry Gill will receive the IBM Corporate Award for the "Development of the GMR head for the computer Hard Drive." Dr. Gill led the development of the GMR head and its integration into the hard drive with the collaboration of several IBM divisions involving research, development, and manufacturing.

In 1997, IBM was the first company to announce disk drive products utilizing Giant Magnetoresistive (GMR) heads. Among Dr. Gill's many contributions to MR and GMR heads, he led the work demonstrating the high thermal and magnetic stability of the Antiparallel Pinned (AP-Pinned, also known as Synthetic spin valves) GMR heads. He also invented clever schemes to provide magnetic bias to the GMR sensor to achieve higher magnetic performance and thermal stability. These heads are now receiving worldwide acceptance from all head manufacturers and disk drive manufacturers.

Dr. Gill's work spans several generations of MR/GMR heads including the heads used in most recent high areal density demonstrations and products announced by IBM. His work led to use of these heads across all disk file programs, including, server, workstation, desktop, mobile and IBM OEM programs.

Dr. Gill holds 58 US Patents on MR/GMR heads with 53 other Patents pending. He is an IEEE Fellow and internationally known for his work in magnetics. He is a regular member of the IEEE Magnetics Society AdCom and served in the past as chairman of the IEEE Santa Clara Valley section and director on the IEEE San Francisco Bay Area Council.

Stanford Summer Course

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Course EESOR 297 is again offered this summer to students and graduates of different backgrounds (engineering, economics, law, business, or other), who are interested in interdisciplinary aspects of worldwide telecommunications development. Topics include (de)regulation, market driven competition, services and networks, subscriber access, technology and standardization, international and regional telecommunications organizations, and the needs of developing countries.

Weekly evening classes are conducted with the participation of prominent guest speakers, and are televised over the Stanford Instructional Television Network (SITN). Students conduct individual or team case studies and make verbal presentations of their term papers in the concluding session of the course. Units; can be repeated for credit.

URL for additional information: http://scpd.stanford.edu/ce/course_descriptions/98994EESOR297.html

Sir Fabio Leite to Visit Bay Area

Great News for Bay Area 3Gwireless Colleagues: The Honorable Sir Fabio Leite, Counselor of IMT-2000 (3Gwireless) of International Telecommunications Union (ITU) will be in Bay Area from June 14 through 16 to address the grand opening of IEEE 3Gwireless '2000 in San Francisco.

>>> *Continued on page 11, col. 3*

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California High Schools Vie for Technical Excellence in Botball Tournament

Reported by David Fong, IEEE Santa Clara Valley K-12 Education Coordinator

Reference: San Jose Mercury March 19,2000 by Truong Phuoc

Hundreds of high school students from California competed on Saturday March 18 in a tournament to see whose robots could score the most points by grabbing ping-pongs. This was competition designed to involve youth in computer technology. The winner of the day's event, the team that walked home with the three-foot trophy, was San Jose's Foothill High School.

The Lego-limbed and computer-programmed creatures didn't actually play Ping-pong. But they did some fascinating tricks.

"They push, they spin, they grab. I swear, I saw some of them dance," said Eric Stokely, a physics teacher from Lincoln High School, whose students were among hundreds of others who came from around the state to Mountain View to participate in the Botball 2000 competition.

"They turn gracefully; they turn jerkily. They steal. Just about any verb that has motion in it."

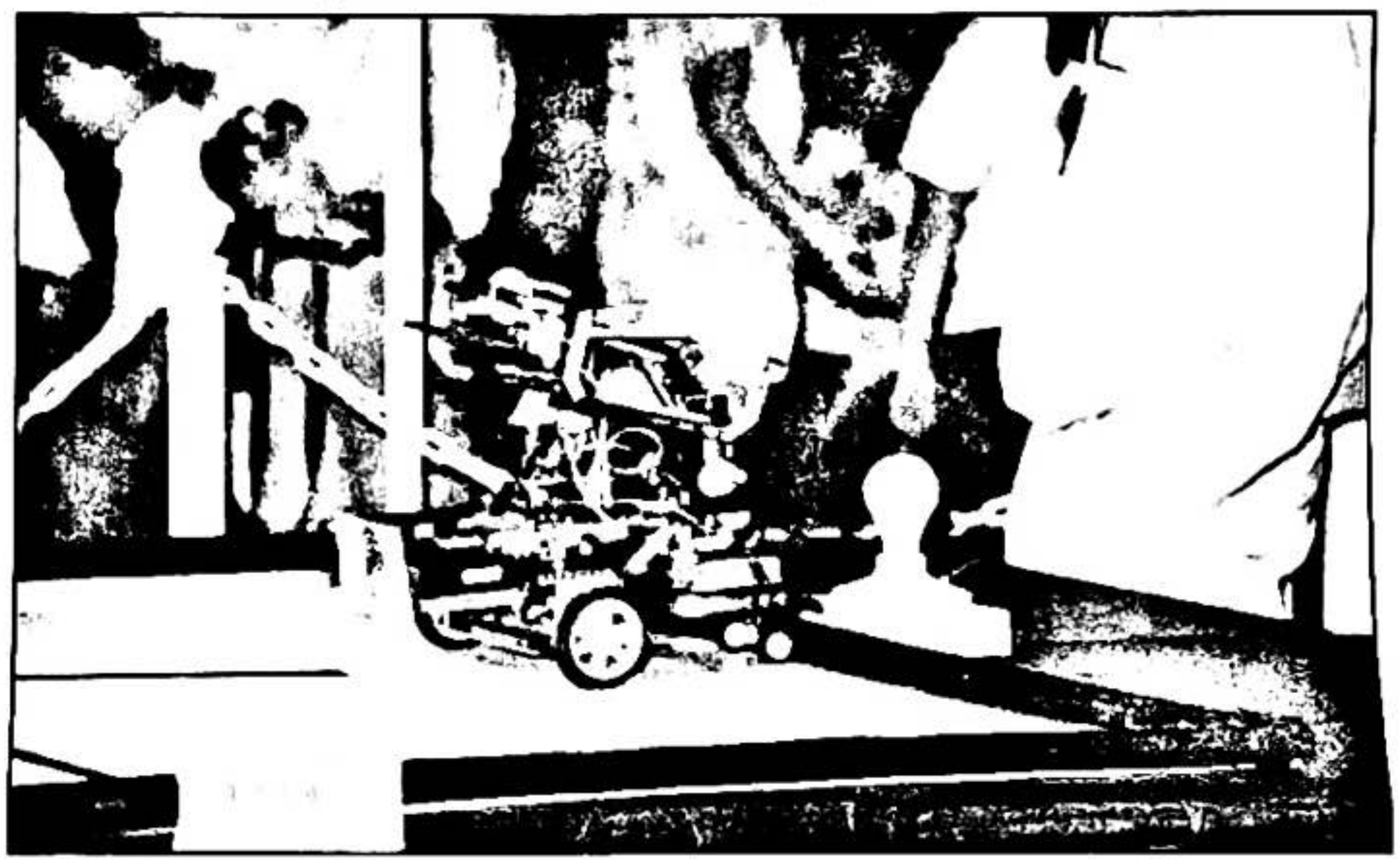
The daylong event was held at the NASA Ames Research Center and is a project co-sponsored by NASA Ames and non-profit KISS Institute for Practical Robotics, based in Oklahoma. Organizers said the tournament was intended to boost students' skills and interest in mathematics, physics and design.

"We gave the students a bucket of parts," said David Miller, technical director of KISS Institute. "And they went off and did their own thing for six weeks."

Organizers said they wanted to reach out to boys and girls — anyone they can get interested in the engineering and technology fields. "This is to get our young people doing technology."

For more information, see http://robotics.nasa.gov/ or contact Terry Grant,NASA Ames Engineer - grant@ptolemy.arc.nasa.gov

Unidentified students make last minute adjustments to their robot.



A Botball robpt swings into action

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Earned doctorate in Electrical Engineering is required. The position is limited to U.S. citizens or permanent residents. Research, consulting and summer employment opportunities re available. The university is the oldest and one of the largest in the California State University System. It is located in the heart of Silicon Valley, the southern end of the San Francisco bay area.

Resume, names and addresses of three references should be submitted to:

Dr. Belle Wei, Chair
Department of Electrical Engineering
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June 19, 2000

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July 19-21, 2000

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July 31-August 4, 2000

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August 7-8, 2000

Minimizing Degradation of Wireless System Performance
August 10-11, 2000

Advanced Wireless&Microwave Techniques
August 14-18, 2000

RF Test Equipment Operation (Lab)
August 21, 2000

RF Testing for the Wireless Age (Lab)
August 22-24, 2000

Signal Integrity, High-Speed, and Power Distribution Design
September 25-26, 2000

RF Circuit Design Using EM Field Simulators
September 26-27, 2000

Bluetooth: an Introduction
October 2-3, 2000

DSP Made Simple for Engineers
October 4-6, 2000

RF and Wireless Made Simple
October 10-11, 2000

RF and Wireless Made Simple II
October 12-13, 2000

New York Metro Area

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May 15-17, 2000

Mobile Computing and Wireless Data Networks
May 15-17, 2000

Applied RF Techniques I
May 15-19, 2000

Frequency Synthesis and PLL Design
May 18-19, 2000

Wideband CDMA Communications
May 18-19, 2000

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May 22-23, 2000

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May 22-24, 2000

All About 3G (Third Generation Wireless)
May 24, 2000

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MAY 2000

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Bay Area Engineer

IEEE CALENDAR OF EVENTS FOR MAY 2000

SCV/Communications

Internet Television Beyond Streaming - Making TV Interactive and Global

David Schwartz and Len Kain, the founders of ImaginOn will be the speakers for the May 10 meeting of the Santa Clara Valley Communications Society. Their presentation will discuss the architecture of a broadband Internet television system implementation presently being deployed.

Based on standard hardware and the TCP/IP protocol, Internet television is a client-server software package written almost entirely in Java. On the server side, Java servlets provide seamless video file to file branching capability for streaming video and automated video content based Web searches.

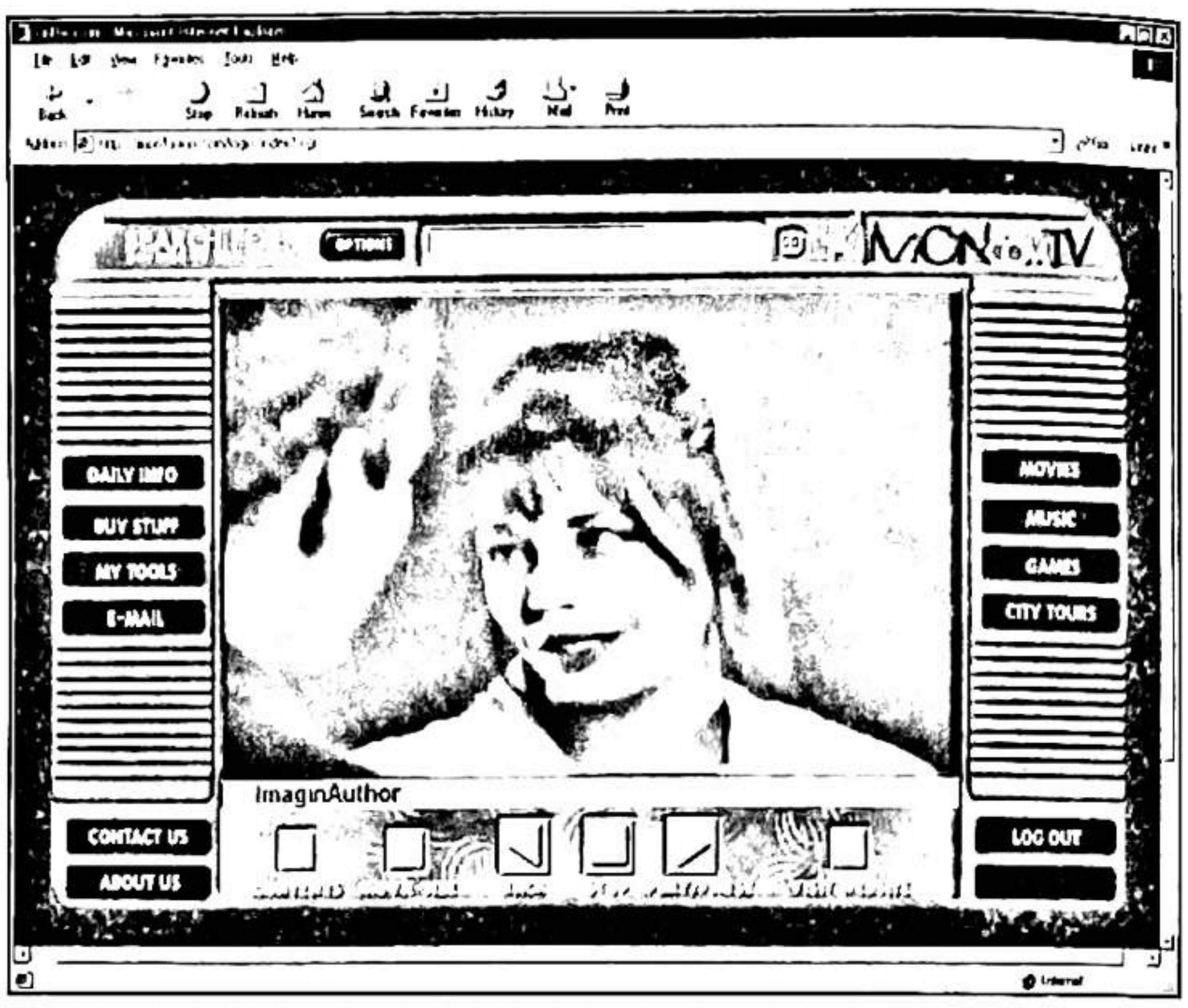
On the user side, a Java applet enables branching video for viewer-directed training and entertainment experiences with instant Web references or e-commerce pages.

Prior to starting ImaginOn, president & CEO David Schwartz was vice president of new media systems and technology at Atari Corporation, where he invented GameFilm technology for videogame applications, and served as a principal designer of the Atari Jaguar CD peripheral. Prior to Atari, David headed the software team at Tandy Research that developed the first erasable CD recorder/player.

Schwartz started Compusonics Corporation, which went public in 1984. In 1985, Compusonics introduced the Compusonics *DSP1000, the first consumer digital audio disk* recorder. The Compusonics Video PC MovieMaker, introduced in 1986 demonstrated real-time digital video recording and editing on a desktop PC. David received a Bachelor of Arts in architecture from Carnegie Mellon University, after completing a multi-disciplinary program in architecture, engineering and computer science. He also participated in post-graduate studies at Carnegie Mellon in the School of Industrial Administration. David has been granted eight U.S. Patents for his inventions and has published numerous technical papers.

Len Kain was most recently manager of real-time systems at Compression Labs, Inc. in San Jose, where he supervised in all areas of multimedia and video communications, including networking, communications framing, audio and video compression, real-time system design, and user interface design.

Prior to this, Len was software manager at Telebit Corporation where he managed development of domestic and international high speed modems and network products. Earlier, Len served with David as director of software development at Compusonics Corporation. Len holds a Bachelors Degree in engineering from Stevens Institute of Technology in New Jersey, a Master's Degree in electrical engineering from Stanford University, and an MBA from the University of Phoenix.



SCV/PEL

Verification and Test, Demonstrations and Discussions

Some of the top power conversion test and measurement products will be previewed and demonstrated by application and product specialists at the May 17 meeting on the Santa Clara Valley Power Electronics Society.

In round table-style open discussions, experts and users will discuss "best practices," real life examples, and relative merits of various techniques and products. Topics will include: accuracy, ease of use, relevance to regulations, cost of owning, measurement techniques, and shortcomings, among others.

YOUR VOTE COUNTS!

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SCV/MTT

The IEEE 802.16 Working Group on Broadband Wireless Access Standards

Broadband wireless access (BWA) systems are being developed worldwide to address the critical "last-mile" problem in telecommunications. Several wired alternatives for broadband access, including fiber, cable modems, and digital subscriber lines, are being deployed. These deployments, however, have limitations and often require tedious infrastructure reconstruction. Broadband wireless access is an alternative that may offer quicker infrastructure build-out at a lower cost.

BWA systems are being developed worldwide in many areas of the spectrum. In many cases, large bandwidths, on the order of 1 GHz, are becoming available, typically at millimeter wavelengths. A key issue for the success of these systems is standardization, which can bring down the cost and thereby extend the reach of these networks to lower-volume users.

In November 1998, a BWA Study Group was chartered by the IEEE "802" LAN/MAN Standards Committee, an exceptionally successful standardization body which is the undisputed world leader in setting low-level data networking standards. The study group effort culminated in the creation of the 802.16 Working Group on Broadband Wireless Access, a standing group authorized to develop a BWA air interface specification and develop a recommended practice on coexistence. Both documents are expected in draft form in the year2000.

A new project to investigate standards from 2-11 GHz was formally approved in March 2000, and a fourth project considering unlicensed bands in also under study.

Roger Marks will address this topic at the May 11 meeting of the Santa Clara Valley Microwave Theory & Techniques Society. His talk provides an overview of BWA capabilities along with a description of the 802.16 standardization effort, including its status and plans.

In early 1998, Roger B. Marks founded the National Wireless Electronics Systems Testbed (N-WEST) to develop laboratory facilities for and coordinate standards for broadband wireless access communications systems. With the support of 46 (currently over 80) supporting companies, N-WEST proposed a BWA Study Group within the IEEE "802" LAN/MAN Standards Committee.

This group was chartered by 802 in November 1998, with Marks as chair. In March 1999, this group was given standing status as the IEEE 802.16 Working Group on Broadband Wireless Access. Marks was selected by the IEEE Microwave Theory and Techniques Society (MTT-S) to address this topic as a Distinguished Microwave Lecturer for the years 1999-2001.

Dr. Marks received his AB in physics in 1980 from Princeton University and his PhD in applied physics in 1988 from Yale University. Following a postdoctoral appointment at the Delft University of Technology (The Netherlands), he has pursued a professional career with U.S. Commerce Department's National Institute of Standards and Technology (NIST) in Boulder, Colorado.

The author of over 70 journal and conference publications, Dr. Marks investigated the electrical characterization of high-speed microelectronic circuits and MMICs, developing fundamental theory and calibration methods including the multiline TRL method. For this work, he received an IEEE Technical Field Award (the Morris E. Leeds Award) in 1995, as well as the 1994 Automated Measurements Technology Award (from the Automatic RF Techniques Group [ARFTG]) and the U.S. Department of Commerce Silver and Bronze Medals. For his standardization work, he received a second Silver Medal in 1999.

A Fellow of the IEEE, Dr. Marks has served on numerous program committees and in professional societies. He was elected to the MTT-S Administrative Committee (AdCom) for the period 1999-2001 and he has chaired the Standards Coordinating Committee since 1996. He has served on the Microwave Prize Committee and as a member of MTT-11 and MTT-20. He has been on the Editorial Review Board of the *IEEE Transactions on Microwave Theory and Techniques* since 1990 and served as associate guest editor of a 1997 special issue.

Dr. Marks was an active member of the ARFTG Executive Committee from 1995-1998 as technical chairman, MTT-S coordinator, and Webmaster. Dr. Marks developed the IEEE Radio and Wireless Conference (RAWCON) and chaired it in 1998 and 1999 as a follow up to the Wireless Communications Conference that he developed and chaired in 1996 and 1997. He served as vice-chair of the 1997 IEEE MTT-S International Microwave Symposium, organizing the Plenary Session, initiating the student travel grant program, and implementing other innovations. He also chaired the 49th ARFTG Conference in 1997. He has served on the Technical Program Committee of the International Microwave Symposium and several other conferences.

SCV/Magnetics

Magnetic Magic Show

Fred Jeffers, Iomega Corp., and 1999-2000 IEEE Distinguished Lecturer, will be the featured speaker at the May 16 meeting of the Santa Clara Valley Magnetics Society.

During his 33 years of work in magnetics and magnetic recording, Fred the magician has collected, elaborated upon, and developed a number of remarkable magnetic "magic tricks". They are demonstrations of magnetic physics, doing seemingly impossible things. Many of the effects demonstrated are at first completely inexplicable, even to experts. No slight of hand is involved. Each trick is based on real physics, and many serve to introduce, and "bring to life" important concepts in magnetics.

The goal of this talk is not only to entertain and mystify, but also to teach. Unlike all other magicians, this "Magnetic Magician" will explain how each trick works and outline the basic physics involved. The show is suitable for any audience, from the grade school level through the most expert.

The Magician received his BS degree from Michigan State University, and his MS and PhD degrees from New Mexico State University. He started working in magnetic product R&D at the Bell and Howell Research Lab in Pasadena in 1967, and was there for seven years. He then moved to Spin Physics/Kodak (later the Kodak Research Lab) in San Diego where he worked in magnetic recording for 24 years. He is now with Iomega Corporation, and works in Escondido.

He has authored or co-authored two dozen highly cited papers, mostly in the magnetic recording field. Among these are the first papers on the important Metal-in-Gap (MIG) ferrite recording heads, used in every video device now in production, and Soft Adjacent Layer (SAL) biased magnetoresistive heads, now used in nearly every computer hard disk drive. He has been awarded nearly 60 U.S. patents.

Please see the calendar of events for meeting and reservations information.

CMOS Technology Challenge

from page 1

All these effects, where the design engineer has to trade off performance for chip area or cost when realizing the integrated circuits, will be discussed.

Also, important to the successful integration of high voltage CMOS circuits, is the device modeling in SPICE, the inclusion of parasitic diodes and parasitic capacitances. The parasitic models include diodes to the substrate and the drain or source well diodes and they facilitate the simulation of substrate leakage currents. A good model must have the default parameters, the well area and perimeter, for the parasitic devices scalable by the device dimensions. Generic models for these devices will be presented.

All devices have safe operating areas and the design engineer must carefully check the operating areas during design and simulation. A proposal will be made of a safe operating area check program. The presentation will conclude with a discussion on layout precautions against parasitic effects: latch-up and ESD.

Navraj Nandra has worked as a mixed signal IC design engineer for more than ten years. From 1987 to 1991 he worked as a research engineer for Thorn EMI's Central Research Labs. in their CAD/VLSI department, where he developed a number of micro power CMOS operational amplifiers and was involved in power electronics for high frequency electronic lighting ballasts. In 1991 he joined Philips Semiconductors as senior analogue IC designer and was involved in the development of A/D and D/A converters for digital audio.

From 1994 until 1997 he worked for EM-Marin in Neuchatel, Switzerland where he developed designs for RFID. In 1997 he joined Austria Mikro Systeme International where he has been designing in high voltage CMOS, Sillicon Germanium and BiCMOS technologies.

He has authored papers in A/D converter design and RFID design. In 1996 he was awarded the best poster for "A ContactlessRead/Write Transponder using Low Power EEPROM technology" at ESSCIRC in Neuchatel. He has a Master of Science degree in microelectronic systems design from Brunel University and a postgraduate diploma in process technology from Middlesex Polytechnic, both in the UK.

See the calendar of events for details.

Santa Clara Valley Section of IEEE
Year End Banquet

Wednesday June 14, 2000

Santa Clara Marriott

2700 Mission College Boulevard

(Near the intersection of 101 and Great America Parkway)

6:00PM Reception / 6:30PM Dinner / 7:30PM Program

The Semiconductor Industry: Driver of The Information Age

A presentation by Dr. Sass Somekh

The semiconductor industry has experienced phenomenal growth over its short history. Integrated circuits have changed the way we work, play, and live, providing the foundation of what is now called "The Information Age." Technology innovation has allowed better semiconductor devices at lower cost. For example, memory chips have experienced a thousand-fold increase in density in fifteen years while it's per bit cost has declined an average 33% each year. No other industry has provided such dramatic benefit at reasonable economical cost to users in so short a time.

Advancements in chip performance are enabled by a combination of two primary forces: innovation in chip design and innovation in manufacturing technology. To continue extraordinary semiconductor growth into the twenty-first century, the semiconductor industry must overcome significant hurdles over the next few years. New materials, manufacturing techniques, and integrated approaches to fab management must be developed if we are to sustain the engine of growth for the global Information Age.

Dr. Sass Somekh, as a member of the Office of the President at Applied Materials, has responsibility for the company's products, product road maps, product positioning and the overall technological capabilities. He received his B.S. in physics in 1969 from Tel Aviv University and his Ph.D. degree in electrical engineering in 1973 from the California Institute of Technology.

In 1988, he received the SEMMY Award, presented by Semiconductor Equipment and Materials International for outstanding accomplishments in establishing plasma etch as a production technology. In 1993, he was recognized as a co-developer of the Precision 5000 system at its induction as the first semiconductor manufacturing system, to be placed in the permanent collection of the Smithsonian Institution in Washington, D.C. In 1994, Dr. Somekh received the SEMI Lifetime Achievement Award for his contribution to the semiconductor equipment industry.

Registration

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SCV/EDS

Flash Memory Technology Evolution - The Next Ten Years

The Market for Flash Memory has been exploding over the past several years, driven by rapid growth in the cellular phone market and the emergence of new digital storage devices such as cameras and music players. On Tuesday, May 16, the Santa Clara Valley Electron Devices Society will host a talk on Flash Technology by Greg Atwood of Intel Corporation. His talk will address the challenges and directions for Flash Memory silicon technology to serve the rapid density growth and performance needs of these markets.

Greg Atwood is a Fellow in Intel's Technology and Manufacturing group. He is responsible for the definition of silicon technologies for flash, networking, and wireless business. He was a member of the first Intel flash development program and has been a key contributor to the six generations of flash technology that Intel has put into production. Greg was responsible for the first Intel StrataFlash™, two bit per cell development program. He has been at Intel for 21 years since graduating from Purdue University with an MS in physics in 1979.

SCV/CPMT

Thru-Silicon Vias for Wafer Level Packaging.

Since its inception in 1959, the integrated circuit has evolved into an extremely complex wiring technology on semiconductor substrates. As a consequence of the dramatic increase in switching speed of active devices, interconnection propagation delays have become the major obstacle to higher operational speed.

Although billions of connections can be simultaneously made in one photolithographic step, all interconnections must reside in the

>>> *Continued on page 8, column 1*

Consultants Network

Consultant's Business Seminar

This one day educational event will be held Saturday May 13, and consists of many short sessions about independent contracting and consulting. There are two concurrent tracks in the morning, and one combined track in the afternoon.

Morning Sessions —Novice Track for Consultant-Contractors

9:00 am Session #1-A.) What I learned in my First Two Years - Panel of Two-Year-Old Independent Contractors Sharing It All, Including Consulting Rate Surveys.

10:00 am Session #2-A.) MARKETING: Best Use of Contract Broker-Agencies, and Finding Job-Leads via the Internet. The lifecycle value of a new satisfied client is very high. How to get that warm sales lead, efficiently.

11:00 am, Session #3-A.) SALES: Selling Without Selling. Learn the power of Relationship Selling, (and avoid the traps of traditional sales techniques). Your style of selling your services can be your natural self with just a few refinements.

Morning Sessions —Advanced Track for Independent Consultants

9:00 am Session #1-B.) BREAKING THROUGH THE $ QUARTER MILLION BARRIER. Panel of Consultants Tell How They Do It. Learn how they converted their practice to High Value Consulting, and find out what they do to keep it Valued Highly.

10:00 am Session #2-B.) CONSULTING CONTRACTS & How to Negotiate Them. Attorney explains what you want to see in a consultant's contract, and how to get it there.

11:00 am, Session #3-B.) SALES: Efficient Methods of Selling Hear the secrets of rapid qualifying of sales leads into profitable business contracts. Process referrals fast, wasting no one's time, especially your own.

Noon, Session 4.) Lunchtime Speakers. Keynote Parade of Vendors sharing Time Saving Ideas and Products for Consultants.

2:00 pm, Session 5.) Combined Track - IRS & EDD: Answers to the Burning Questions! Can you be converted to an Employee against your will and against your Client's will? Ask the IRS agent, and the Employment Development Department Agent yourself. Q & A.

3:00 pm, Session 6.) INTERNET INTEGRATION INTO YOUR CONSULTING PRACTICE & AUTOMATING YOUR BUSINESS CHORES: Panel of Experts Share Their Tools. Automation, the Internet, and other time saving business improvements for your consulting practice.

4:00pm, No Host Bar & Networking opportunity.

The Seminar fee includes Lunch and Keynote Parade of Speakers. For more details, check it out at the www.ieee-sv-consult.org Web site, or the www.patca.org Web site. Remember, this May 13 Saturday seminar has an early bird discount reservation deadline of Monday, May 8.

See the calendar for details.

SATURDAY MAY 6
SF Power Engineering Society
Subject: **One Day Short Course: Power Quality**
Speaker: Various
Time: 7:30 a.m. to 5:00 p.m.
Place: San Francisco State University
RSVP: Chase Sun, 415 973-2233

TUESDAY MAY 9
SCV Electromagnetic Compatibility Society
Subject: **Radiation from Edge Effects in Printed Circuit Boards**
Speakers: Dr. Zorica Pantic-Tanner (San Francisco State University) and Franz Gisin (Nortel Networks)
Time: 7:30 p.m.
Place: Silicon Graphics Café Iris, Building 5, 2025 Stierlin Court, Mountain View
RSVP: Not required
Article: Page 7

WEDNESDAY MAY 10
SCV/Communications
Subject: **Internet Television Beyond Streaming - Making TV Interactive and Global**
Speaker: David Schwartz (ImaginOn)
Time: Networking and pizza at 6:30 p.m., speaker at 7:00
Place: National Semiconductor Credit Union Building 955 Kifer Road, Sunnyvale
RSVP: Pizza available for those who RSVP to ieee_com@pdt.com
Article: Page 4

WEDNESDAY MAY 10
SCV Components, Packaging & Manufacturing Technology
Subject: **Thru-Silicon Vias for Wafer Level Packaging**
Speaker: John Reche (Tru-Si Technology)
Time: Dinner at 6:30 p.m., presentation at 7:30
Place: Embassy Suites, 2885 Lakeside Drive, Santa Clara
Cost: $15 if reserved by May 7, $20 after that
RSVP: 1-800-686-9366 or email to cpmt-ttarter@mindspring.com
Web: www.cpmt.org/scv
Article: Page 5

THURSDAY MAY 11
SCV Microwave Theory & Techniques Society
Subject: **The IEEE 802.16 Working Group on Broadband Wireless Access Standards**
Speaker: Dr. Roger Marks (National Institute of Standards and Technology)
Time: Social at 6:00 p.m., presentation at 7:00
Place: National Semiconductor Auditorium, Bldg. 41 on Kifer Rd. between Wolfe Rd. and Lawrence Expressway, Sunnyvale
RSVP: Not required
Article: Page 4

SATURDAY MAY 13
IEEE Consultants Network of Silicon Valley
Subject: **One Day of Short Sessions - Consultant's Business Seminar**
Speaker: Many, including Web Marketing and Sales professionals, Lawyers,Panels of Senior Consultants, Contract Brokers
Time: Registration at 8:00 a.m., presentations from 8:30 a.m. to 4:00 p.m., including lunch.
Place: Sheraton Hotel, 1100 N. Mathilda, Sunnyvale (408 745-6000)
Fees: Members $160, non-members $195, student members $95. Early bird discount of $20 for reservations on or before May 8.
RSVP: 650 903-0399
Web: www.ieee-sv-consult.org
Article: Page 6

TUESDAY MAY 16
SCV Electron Devices Society
Subject: **Flash Memory Technology Evolution - The Next Ten Years**
Speaker: Greg Atwood (Intel Corporation)
Time: 6:30 p.m.
Place: National Semiconductor Credit Union, Bldg. 31, 955 Kifer Road, Sunnyvale
RSVP: Not Required
Article: Page 5

TUESDAY MAY 16
SCV Magnetics Society
Subject: **Magnetic Magic Show**
Speaker: Fred Jeffers (Iomega Corp.) 1999-2000 IEEE Distinguished Lecturer
Time: Cookies and conversation at 7:30 p.m., presentation at 8:00
Place: Lockheed Research & Development Division, Building 202, Auditorium, 3251 Hanover St., Palo Alto
RSVP: Not required
Article: Page 5

WEDNESDAY MAY 17
SCV Engineering in Medicine & Biology Society
Subject: **The Future Role of Telemanipulators and Telerobotics in Surgical Procedures**
Speaker: Frederic H. Moll, MD (Intuitive Surgical, Inc.)
Time: Dinner at 6:00 p.m., presentation at 7:15
Place: Dinner in the Stanford Hospital Cafeteria, presentation in Room M114 of the Stanford Medical School
RSVP: Not required
Article: Page 12

WEDNESDAY MAY 17
OEB Nuclear & Plasma Sciences Society
Subject: **Characteristics and Applications of Gyrodevices**
Speaker: Monica Blank (Communications and Power Industries - formerly Varian)
Time: 7:30 p.m. - there will be a tour after the presentation
Place: Communications and Power Industries (CPI), Bldg. 2, 811 Hansen Way, Palo Alto
RSVP: Not required
Web: www.sirius.com/~banchero/ieee/
Article: Page 1

WEDNESDAY MAY 17
SCV Power Electronics Society
Subject: **Verification and Test, Demonstrations & Discussions**
Speaker: Application and product specialists
Time: Social at 6:30 p.m. (pizza and sodas will be served), presentation at 7:00
Place: Nortel, Building SC1, 4401 Great America Pkwy (at corner of Mission College Dr.), Santa Clara. The corner building is SC1, meeting is in the California Zephyr room, just off the lobby
RSVP: Not required
Web: www.nvo.com/scvpels for changes and additional information
Article: Page 4

THURSDAY MAY 18.
OEB Industry Applications Society
Subject: **Options for Life Extension and/or Upgrade of Low and Medium Voltage Switchgear**
Speaker: Keith Gray (Pacific Breaker Systems)
Time: No-host social at 5:30 p.m., presentation at 6:15, dinner at 7:15, presentation continued at 8:00.
Place: Marie Callendar Restaurant, The Garden Room, 2090 Diamond Blvd., Concord (nearby to Concord Hilton Hotel). 925-827-4930 for directions.
Cost: $20 for members, $24 for non-members, and $12 for unemployed members, students with valid school ID, or young engineers who graduated within the last 5 years.
RSVP: Gregg Boltz 925 210-2571 by May 16
Article: Page 7

THURSDAY MAY 18
OEB Communications Society
Subject: **Broadband Wireless Access Technologies and Applications**
Time: 7:00 p.m.
Place: Pacific Bell, 2600 Camino Ramon, San Ramon (I-680 North to Bollinger Canyon Rd., east on Bollinger Canyon Rd., left on Camino Ramon)
RSVP: Not required (Info: Ron Brost, rdbrost@msg.pacbell.com, or 925 823-4389)
Article: Page 8

THURSDAY MAY 18
SCV Solid State Circuits Society
Subject: **High Voltage Sub-micron CMOS Technology Challenges**
Speaker: Navraj S. Nandra (Austria Mikro Systeme International Inc.)
Time: Refreshments at 6:30 p.m., presentation at 7:00
Place: Cadence Design Systems, Bldg. 5, Cafeteria, 2655 Seely Ave., San Jose
RSVP: 408 894-2646 (leave a message) or by email to ssc_scv_rsvp@egroups.com - For email reminder subcribe to ssc-chpt-scv@majordomo.ieee.org
Web: www.ewh.ieee.org/r6/scv/scv_ssc.html
Article: Page 1

THURSDAY MAY 18
SCV Signal Processing Society
Subject: **Signal Processing for Internet Video Streaming**
Speaker: Dr. Jian Lu (EnjoyWeb.com, Inc.)
Time: 7:00 p.m., refreshments provided
Place: National Semiconductor Auditorium, 955 Kifer Rd., Sunnyvale
RSVP: Not required
Article: Page 9

TUESDAY MAY 23
SF Industry Applications Society
Subject: **Hybrid Lighting – Illuminating our Future**
Speaker: Gus Bernal (DayLit Natural Lighting Technologies and Adaptive Energy Systems)
Time: Social at 5:00p.m., presentation at 6:00. Dinner at 7:00, discussion at 8:00
Place: Sinbad's Restaurant, Pier 2, San Francisco
Cost: $25.00 ($12.00 students and unemployed)
RSVP: 415 693-4011 by Friday, March 24
Article: Page 12

TUESDAY MAY 23
SCV Lasers and Electro Optics Society
Subject: **Micro-Opto-Electro-Mechanical Systems**
Speaker: Dr. Ming Wu (UCLA)
Time: Dinner at 6:00 p.m., lecture at 8:00
Place: Dinner at Ramano's Macaroni Grill, 110 Ranch Drive, Milpitas, in McCarthy Ranch shopping center, lecture at LSI Logic, 1621 Barber Lane, Milpitas - enter the north lobby.
RSVP: (dinner) Amanda Bowhill, 408-428-5478 or abowhill@cadence.com
Article: Page 9

TUESDAY MAY 23
SCV/EMC Product Safety Technical Committee
Subject: **Harmonization with and Utilization of IEC Standards**
Speaker: Kent Jones PE (Underwriters Laboratories Inc.)
Time: Dinner at 5:30 p.m., presentation at 7:10
Place: Dinner at Santa Clara El Torito's, 2950 Lakeside Drive (408 727 4426), presentation at Applied Materials, 3135 Kifer Rd., Bldg. 27, Santa Clara (Between Lawrence Exprwy and Bowers).
RSVP: (for Dinner only): julialuke@aol.com or 408 919 3762
Article: Page 7

WEDNESDAY MAY 24
SCV Industry Applications & Power Engineering Societies
Subject: **Automated Power Exchange**
Speaker: Mike Heinrich and Edward Cazalet (APX)
Time: 7:00 p.m.
Place: Oak Room, Bldg. 48, Hewlett-Packard, 19447 Pruneridge, Cupertino
RSVP: Not required
Article: Page 12

WEDNESDAY MAY 31
SCV Engineering Management Society
Subject: *(Management Forum)* **Creating Performance Excellence Through Project Management**
Speaker: Phil Bristol (Bristol & Associates, Inc)
Subject: *(Dinner Presentation)* **A New Model for IT Effectiveness**
Speaker: Scot Klimke (Network Appliance, Inc)
Time: Registration beginning at 5:30 p.m., Management Forum at 5:45, dinner at 7:00, speaker at 7:45, adjourn at 9:00
Place: Wyndham Garden Hotel, 1300 Chesapeake Terrace, Sunnyvale near Lawrence Expressway (Caribbean) at Hwy 237
Cost: With reservations on/before May 26 $15 (IEEE members), $20 (non-members), $5 (Student IEEE members); $5 surcharge thereafter. (Cash or check at the door)
RSVP: www.ieee-scv-ems.org - Rich Hendrickson at 408 933-4469 for more information
Article: Page 10

FRIDAY JUNE 2
SCV Power Engineering and Industry Applications Society
Subject: **Annual Year-end Dinner Celebration**
Time: Wine tasting at 6:30 p.m. dinner at 7:30
Place: Mirassou Champagne Cellars, 300 College Avenue, Los Gatos
Cost: $32 each For IEEE member and one guest, $42 each for additional guests or non-members
RSVP: (by May 31) Rich Celio, 408 342-0790 or rcelio@apt4power.com
Article: Page 1

WEDNESDAY JUNE 14
Santa Clara Valley Section
Subject: **Year End Banquet - The Semiconductor Industry: Driver of The Information Age**
Speaker: Dr. Sass Somekh (Applied Materials)
Time: Reception at 6:00 p.m., dinner at 6:30, program at 7:30
Place: Santa Clara Marriott, 2700 Mission College Boulevard (near the intersection of 101 and Great America Parkway)
Cost: $35 per person - $10 discount for IEEE Section, Chapter and Student Officers
RSVP: Council Office, 650 327-6622 or ma.turner@ieee.org
Article: See the ad with registration form on page 5

Download this calendar at
www.ee.com/grid

OEB/IAS

Options for Life Extension and/or Upgrade of Low and Medium Voltage Switchgear

The May18 meeting of the Industry Applications Society for the Oakland East Bay will feature a talk entitled "Options for Life Extension and/or Upgrade of Low and Medium Voltage Switchgear." The presentation will examine the options available to extend the life of low and medium voltage (480 to 38,000 volt) switchgear. It will also examine options available to upgrade existing switchgear ratings without removing the existing switchgear structure. Definitions of retrofit, retrofill and replacement options will be explored, as well as the design and proof testing of the options. Case studies will be presented of the options being discussed.

The speaker will be Keith Gray, principal engineer at Pacific Breaker Systems, located in Napa. Keith has been a practicing design engineer for 27 years. He graduated with an electrical engineering degree from Staffordshire College of Technology. Keith designed HVAC and medium voltage circuit breakers, and has been circuit breaker development manager for Brown Bovari, Golden Gate Switchboard, and Siemens. Keith is a past chairman of the IEEE Switchgear Committee and currently vice chairman, standard coordinator.

SCV/EMC

Radiation from Edge Effects in Printed Circuit Boards

Propagating electromagnetic fields are generated whenever charge is accelerated. The polarization, direction, and mode of these fields are dependent on the structure that contains the accelerated charge. In printed circuit boards (PCBs), they include radiation from unwanted parasitic modes associated with tangential (planar) structures such as traces routed on outside layers (microstrip), and traces routed between ground and power planes (striplines).

Structures normal to the ground and power planes such as vias also generate surface waves in the dielectric strata directly adjacent to the outside ground/powerplanes, and radial TEM waves between internal ground and power planes. As these fields propagate outward, they encounter the edge of the PCB. The edge presents a boundary discontinuity, and a portion of the energy in the propagating fields is reflected back into the PCB structure, a portion radiates outward from the edges of the PCB, and, depending on the angle of incidence, a portion also propagates tangentially around the edge of the PCB, exciting natural resonant modes within the PCB that also contribute to the total radiated energy.

Using analytical modeling tools such as the Finite Difference Time Domain (FDTD) method and Fast Fourier Transform (FFT) algorithms, one can isolate the time and frequency domain components each of these various propagating modes have on the total radiation from PCB edges, and evaluate the effectiveness of such popular edge radiation minimization techniques as adding a row of closely spaced vias that short together all the ground planes within a multi-layer PCB (fences), and pulling back the power planes from the edges.

Dr. Zorica Pantic-Tanner and Franz Gisin will discuss this topic at the May 9 meeting of the Santa Clara Valley Electromagnetic Compatibility society. Their presentation includes a brief theoretical analysis of each of the different kinds of propagating modes, the effect the PCB edge has on each mode, and how fences and pulled-back power planes affect the total radiation efficiency from the PCB edge. The presentation also includes several time-domain animations that enhance the physical understanding of how these propagating modes produce radiation along PCB edges.

Dr. Zorica Pantec-Tanner

Franz Gisin

Dr. Zorica Pantic-Tanner is director of the SFSU School of Engineering, and director of the SFSU Center for Applied Electromagnetics, a research facility that provides resources for theoretical and experimental studies in applied electromagnetics. She received her BS, MS, and PhD degrees in electrical engineering from the University of Nish in 1975, 1978,and 1982, respectively. After graduating she became an assistant professor and then associate professor in the Department of Electronic Engineering at the University of Nish.

In 1984 she was awarded a Fulbright Scholarship for postdoctoral research in the area of applied electromagnetics with the Electromagnetics & Communications Lab of the University of Illinois at Urbana-Champaign. In 1989 she joined the School of Engineering at San Francisco State University.

Dr. Pantic-Tanner's research and teaching interests are in the areas of electromagnetic field theory, applied electromagnetics, and electromagnetic compatibility (EMC). She has published over 50 conference and journal papers in these areas. Dr. Pantic-Tanner is chair of the Santa Clara Valley Chapter of the IEEE EMC Society, a member of the IEEE EMC Society Education Committee, and vice-chair of the IEEE EMC Society Technical Committee TC-9 on Computational Electromagnetics. Under the IEEE EMC Society sponsorship, she has also developed and taught several EMC courses.

Franz Gisin is EMC manager at Nortel Networks. He received his BS degree in electrical engineering from the University of Idaho in 1972, and his MS degree in applied mathematics from the University of Santa Clara in 1986. Franz has been active in the EMC community for over 25 years, and has published numerous papers ranging from measurement uncertainties associated with 1/R extrapolation on OATS to mechanisms of common mode radiation from PCBs with attached cables.

He is a past EMC Society Distinguished Lecturer and a past member of the EMC Society Board of Directors. Currently he is steering committee chair of the 2004 IEEE International Symposium on Electromagnetic Compatibility. He also teaches electromagnetics (on a part-time basis) at SFSU.

Please visit our Web site (www.scvemc.org) frequently for details and updates. Also, the annual election for secretary will be held prior to the presentations. For nominations, questions or to volunteer, please contact Franz Gisin at emc_one@yahoo.com.

SCV/PSTC

Harmonization with and Utilization of IEC Standards

During the past 20 years, several new U.S. product safety standards have been written which are now more consistent with requirements in effect in other countries. Many benefits and some difficulties are associated with this development. Increased efficiency can be realized by designing, manufacturing and evaluating products built to meet a single, worldwide standard.

New related requirements and broader perspectives in Harmonized Standards can make compliance determination and interpretations more involved. Worldwide safety certification of equipment by a single service provider (such as UL) has become reality as a result of developing standards based on International requirements.

Kent Jones, PE, will discuss these standards at the May 23 meeting of the Santa Clara Valley EMC Product Safety Technical Committee. The presentation includes examples of Harmonized Standards (including UL3111-1) and a Bi-National Standard (UL 1950/60950) and helpful information pertaining to the use of Part 2 Particular Requirement standards for specific types of equipment.

Kent Jones is a staff engineer, and the primary designated engineer for test and measuring equipment categories, and a designated engineer for laboratory equipment for Underwriters Laboratories Inc.

Through Silicon Vias

from page 5

same plane. Inevitably, 3-dimentional interconnection technology must be developed to minimize the signal path. The concept is not new, however efficiently forming vias in the semiconductor wafers has remained unsatisfactory until recently because of fabrication complexity resulting in poor yields.

Tru-Si Technology has introduced a new process, based on atmospheric downstream plasma (ADP) which produces a dry chemical etching (DCE). When ADP is applied to the back of silicon wafers, the rates of silicon removal allow an efficient thinning of the wafers. In this new process, there is no mechanical stress causing breakage of the thin wafers or messy chemicals to contend with.

Taking advantage of its unique ability to produce very thin silicon wafers at high yield, Tru-Si Technology is developing a 3-dimensional wafer level packaging technology. ADP etching uses a mask to etch vias in the silicon. The vias are produced in two self-aligning steps by etching the front of the wafer followed by deposition of a dielectric and metallization. The back of the wafer is then ADP etched. Wafers interconnected through vias can be stacked to form a 3-dimentional network. This work leads to the development of 3-D wafer level packaging where stacks of dies are separated after stacking.

John Reche, director of advanced packaging at Tru-Si Technologies in Sunnyvale, will discuss this new packaging at the May 10 meeting of the Santa Clara Valley Components, Packaging & Manufacturing Technology Society.

John's responsibilities at Tru-Si include design and implementation of the novel 3-dimentional Thru-Silicon wafer interconnect. He has recently assembled a thin-film lab in order to shorten the development time and experiment with materials and services difficult to procure by subcontract. In addition to the Atmospheric Downstream Plasma etching equipment, Tru-Si can sputter thin-films, do front and back photolithography on 6 and 8" wafers and align stacked wafers for bonding.

John has twenty years experience in building microwave thin-film modules, magneto-optic devices and MCM-D. He has worked in large corporations such as Litton and GTE, as well as for several start-up companies. John has also worked as an independent consultant for many years. He founded a Silicon on Silicon Multichip modules company in the late 80's, which pioneered high-speed digital, interconnects. He has published and presented over 60 technical papers at technical meetings.

YOUR VOTE COUNTS!

See Election Special on page 10

OEB/Communications

Broadband Wireless Access Technologies and Applications

There has been tremendous interest recently in broadband wireless access systems (BWA), scheduled to start services around the year 2000. This has been the subject of much research and many standardization activities throughout the world. ITU-R JRG 8A-9B, ETSI-BRAN and IEEE802.16 are taking the initiative to produce proposals of radio transmission technologies (air interface) and advanced systems prototypes for BWA.

Dr. Willie W. Lu will present research and development updates in this field at the May 18 meeting of the Oakland/East Bay Communications society. He will also present an overview of the-state-of-the-art of this BWA wireless storm - globally or locally, as well as perspectives on future development in order to promote future technical activities.

The talk will include: systems and functional requirements; QoS definition and services convergence (IP, ATM, MPEG, STM, etc); medium access control and bandwidth allocation; physical layer and various transmission convergence; convergence of wireless access and Internet access; standardization progress (IEEE802.16, ITU-JRG8A.9B, etc); and a case study.

Dr. Willie W. Lu has extensive research, publication, consulting, and industrial experience in the design and analysis of advanced wireless telecommunication systems and networks, computer communication systems, local, metropolitan, and wide area communications networks, marketing analysis and planning. He has profound expertise in the implementation of software definable base station technology, wireless mobile ATM technology, third generation mobile communications, broadband wireless access, and high-speed packet networks as well as IP/ATM network interconnections.

Dr. Lu is also the chair of Wireless Mobile ATM Task Force, chair of IEEE CDMA Technical Forum and chair of IEEE 3gWireless Technical Forum, technical teams of telecommunications and wireless communications experts who develop and implement the next generation wireless multimedia systems.

Previously, Dr. Lu served as guest scientist and post-doctorate staff of the German National Research Center for Information Technology (GMD) in Berlin. His other work has involved the design of USA CDMA system at Nortel, wireless data network at NTT, and multimedia communications for MIMOS of Malaysia.

Dr. Lu is highly accredited and an invited technical advisor by major telecom industries in the USA and Europe, as well as a senior consultant of many telecom authorities in the world. Dr. Lu is an IEEE senior member, now nominated to IEEE Fellow, and served as general chairman of the IEEE wmATM'98, IEEE wmATM'99, IEEE Globecom'2000 Broadband Wireless, IEEE 3gWireless'2000, WAS'2000 and IFIP BWAN'2000 conferences; and has organized many other workshops and symposia.

Please see the calendar of events for details.

imec

IMEC Hands-on Training in Digital Multimedia and Telecom Systems

System Level Design for Reduced Memory Power and System Bus Load

May 15 – 18, 2000, Marriott Hotel, Santa Clara, CA

Join IMEC, a leader in microelectronics R&D, at a hands-on training course for system, algorithm and architecture designers. You'll learn a systematic methodology for creating data-dominated applications like real-time digital multimedia and telecom systems. We'll show you how to design cost-efficient systems offering increased performance while reducing power consumption by as much as one order of magnitude.

The course will teach you a two-stage methodology, applicable to both custom hardware realizations and programmable instruction-set processor mapping:
1) Platform-independent stage: rewriting of the high-level specification, supported by dedicated tools
2) Mapping on a specific platform: optimizing the code for a physical memory organization
The methodology is independent of a specific capture formalism, but uses the familiar C language for practical illustrations.

Register online at www.imec.be/mtc/newpage3.htm, or fax this form and payment to IMEC, Inc., 960 Saratoga Avenue, Suite 206, San Jose, CA 95129, (T) 408.551.4502, (F) 408.551.4505, (E) beyen@imec.be

REGISTRATION FORM – Fee: $3000

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SEMICONDUCTOR

Polycrystalline Silicon: Technology and Applications
May 22-23, San Francisco Airport

Cu- and Al-Based Interconnect Systems
June 8-9, San Francisco Airport

COMMUNICATIONS

Data Communications: From Basics to Broadband
July 17-19, San Francisco Airport

Competing Protocols for Voice over IP
July 22 and 29, Fremont

IP/ATM Networks: Switching, Routing, and Internetworking
August 2-4, San Francisco

DESIGN

Physical Design with Deep Submicron Processes
June 8-9, San Francisco Airport

Electronic Product Design and Retrofit for EMC
July 13-14, San Francisco

High-Speed PCB and System Design
August 28-29, Redwood City

Simulation Tools and Simulation Methods for PCB and System Design
August 30, Redwood City

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SECURITY

Enterprise Security
August 9-11, San Francisco

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August 14-16, San Francisco

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SCV/SPS

Signal Processing for Internet Video Streaming

Video streaming is one of the most exciting applications on the Internet. It has already created a new business known as Internet broadcast, or Intercast/Webcast. While video streaming is a commercial success story, it remains very much a black art owing to its root in proprietary commercial development. The purpose of this talk is to review several important issues in Internet video streaming from a signal processing perspective.

Jian Lu will discuss this topic at the May 18 meeting of the Santa Clara Valley Signal Processing Society, drawing from his own experience in developing one of the major commercial media streaming systems. He will describe what he believes to be the most challenging problems in video streaming and evaluate a number of signal processing solutions that have been proposed; some of these solutions have already been implemented in experimental and/or commercial video streaming systems.

To make the review useful to both researchers and application developers, Dr. Lu will try to clearly identify among the proposed solutions what works in real world, what doesn't, and why?

This talk is expected to be helpful to application developers who want to learn what signal processing solutions are available for video streaming, and to signal processing researchers and engineers who want to better understand video streaming systems and architecture, and their associated constraints on signal processing solutions.

Jian Lu is chief scientist at EnjoyWeb.com, a start-up company in Silicon Valley specializing in rich media content delivery on the Internet. Prior to joining EnjoyWeb this year, he was a senior scientist in the Interactive Media Group at Apple Computer for four years, where he developed algorithms and software for media compression, streaming, and interactivity for Apple's QuickTime. He also represented Apple in the development of the emerging ISO JPEG-2000 and MPEG-4 standards.

Dr. Lu received his PhD from Dartmouth College in electrical engineering in 1993. He has been serving as vice chair and program chair for the SCV Chapter of IEEE Signal Processing Society since 1997.

Please see the calendar for details.

SCV/LEOS

Micro-Opto-Electro-Mechanical Systems

Micromachining, or Micro Electro Mechanical Systems (MEMS), technology has opened up many new opportunities for optical and optoelectronic systems. Movable structures, microactuators, and micro-optical elements can now be monolithically integrated on the same substrate using batch processing technologies.

Many new functional devices are enabled by MEMS technology. It has already produced a large impact in several industries, including display and telecommunications. For example, optical switches with low insertion loss and low crosstalk have been reported by several research groups. Portable projection display with XGA resolution is now commercially available, thanks to MEMS technology. MEMS is also the key enabling technology for many wavelength-division-multiplexed (WDM) components such as add-drop multiplexers, optical crossconnects (particularly those with large port count), tunable laser source, and detectors.

Prof. Ming C. Wu will discuss this technology at the May 23 meeting of the Santa Clara Valley Lasers and Electro Optics Society. In his talk, Dr. Wu will review the state of the art of optical MEMS technology, and describe some of his own research work at UCLA.

Ming C. Wu received his MS and PhD degrees in electrical engineering from UC Berkeley in 1985 and 1988, respectively. From 1988 to 1992, he was a member of technical staff at AT&T Bell Laboratories in Murray Hill. He joined the faculty of electrical engineering department of UCLA in 1993, and is currently a professor there.

His current research interests include micromachined micro-optics (Optical MEMS), and high-speed optoelectronics. Dr. Wu is the director of the ONR MURI Center on RF Photonics. He was general co-chair of the IEEE LEOS Summer Topical Meetings in 1995 (RF Optoelectronics), 1996 and 1998 (Optical MEMS), and program committee chair of the 1997 MOEMS (Micro Opto Electro Mechanical Systems) Conference. He received the Packard Foundation Fellowship in 1992, and the GOMAC Meritorious Conference Paper Award in 1994. He has published over 250 scientific papers and holds 8 U.S. patents.

SCV/EMS

Management Club Looks at Managed-project Culture and the Enterprise Value Chain

The IEEE Engineering Management Society's May 31 meeting will start with a before-dinner workshop on *managed-project* techniques for project selection and chartering. This will be followed by open networking and a sit-down dinner. The after dinner presentation continues the EMS executive presentation series, this month on managing information technology activities as a consumer of enterprise services as well as a service provider.

Management Forum:

Creating Performance Excellence through Project Management

One of the five essential capabilities that accelerate organizational performance is selecting and chartering projects. Each year, organizations must make critical decisions regarding the selection of projects to initiate - projects that add the maximum value to the company, i.e. the contribution of the project to the organization on the whole, measured against project cost and the risk.

Mitigating risks, managing expectations, and producing results begin when organizations are able to create project portfolios that align project contributions with the mission of the business and charter-selected projects for success. Phil Bristol, president of Bristol & Associates will present the five capabilities, with a workshop focus on project selection and chartering activities.

The goal of *Faster, Better, Cheaper*, combined with a dynamic marketplace, product complexity, and global competition, create inordinate pressures on executive management's ability to increase earnings per share and return on investment. A significant source of reduced profitability and productivity is product development and business process improvement initiatives that do not deliver. Poor performance becomes evident when projects miss the commitment date, significantly exceed a budget, or fail to satisfy the customer's requirements. Rather than vaulting to an industry leadership position, the organization enters a tailspin of a smaller market share.

Managing complexity is every executive's mandate. Establishing within a company the necessary processes to manage complexity effectively becomes the key to organizational success. World-class organizations are adopting the *managed project culture* as the solution.

Creating a managed project culture increases organizational productivity, aligns initiatives to business needs, focuses the organization on essential actions, sets reasonable expectations, and clarifies accountability for results. The four root-causes of project failures leads to understanding the essential capabilities an organization needs to accelerate performance.

What process does your organization follow to ensure it is devoting already scarce resources only to essential activities? Are work efforts aligned with the strategic direction of the company? Once selected for implementation, do project start-up activities increase the opportunity for success? This presentation looks at one of the five essential capabilities, which accelerates organizational performance: selecting and chartering projects.

The forum will be led by Phil Bristol, who has over 25 years of project management, systems management and organizational development experience. Mr. Bristol is highly respected for his integrated approaches to solving complex organizational issues. He has the unique ability to quickly find essential root causes to problems and help management set a realistic plan of action. He is focused on client-oriented strategic systems planning, business process improvement and enterprise-wide project management, which allow organizations to focus on essential activities, create convergent team thinking, promote a bias for results and clarify responsibilities. These products are performance proven to accelerate organizational excellence. Currently, Phil is teaching project management courses as an adjunct faculty member associated with San Jose State University.

Dinner presentation:

A New Model for IT Effectiveness

Although businesses now view IT investments as strategic, the dichotomy between the IT and business agendas has generally not been solved by traditional CIO alignment strategies. Rather, a new model needs to be adopted; this model views IT in the context of the *enterprise value chain*, with organizational, procedural, and cultural elements that differ from traditional and '90's genre IT.

Scot Klimke, CIO and vice president of information systems for Network Appliance, will present this model in general, with particular emphasis on implementation techniques.

According to the annual Gartner Group poll of CIOs, IT organizational alignment with the business is a perennial top five priority. However, traditional IT organizations are often perceived within the business to be out of touch with enterprise goals and, even more so, marching to the tune of a different drummer. The demands of the business are often viewed by IT as exactly that – demands. The flexibility necessary to run a business, particularly in the cost-conscious, internet-paced time frame of the new millennium, run contrary to the predictive, ponderous, and often insular IT organization.

Organizing and operating IT around a new paradigm modeled on the enterprise value chain promises to return a result more valuable to the business. In this scenario, IT becomes more of a virtual operation, and the traditional business/IT chasm is brought into the heart of the organization. In the '00 decade, the new IT will organize around two specific areas: functional centers of competency, and the more traditional operations. Competency centers reflect the organization of the business and are staffed with business specialists who have some IT experience. The model requires the development of a protocol to handle intra-organization communications.

Aside from these organizational considerations, in the value chain model, IT is both a consumer of enterprise services as well as a service provider. As such, IT must integrate not only at the customer end but also with the supply chain. IT is then best positioned to drive the agenda of the business throughout the value chain. There are several techniques that can assist IT in performing that function. These techniques will be the emphasis of the discussion.

Scot Klimke is the CIO and vice president of information systems for Network Appliance. He is responsible for the day to day management of Network Appliances' worldwide computing infrastructure, business process automation and business data operations. Mr. Klimke has over 13 years of IT management experience in the high technology, banking, and defense industries.

Mr. Klimke received an MSEE degree from Illinois Institute of Technology. He also holds a BSEE degree from Southern Illinois University. Prior to Philips, Mr. Klimke spent nine years in a series of IS management roles for Cirrus Logic, most recently as director of information technology, responsible for the company's worldwide Web infrastructure and leading the rollout of Cirrus Logic's SAP operations.

IEEE

ELECTION SPECIAL ✓

It's time once again to elect the Section Excom officers— only this year it will be a little different than in past years. Two of the Sections (Oakland/East Bay and San Francisco) are switching over from a fiscal year to a calendar year, and are asking that their current officers serve out an extended term until December 31, 2000. The ballots for those two Sections simply ask you to vote on that issue. These two Sections will hold another election later this year to elect officers for the calendar year starting January 1, 2001. The third Section, Santa Clara Valley is remaining on its fiscal year (July 1, 2000 through June 20, 2001) and asks you to vote on a new slate of officers for that term. You will find your ballot inside The Grid. Be sure you select the right one for your Section and please vote. The ballot is a return reply card and requires no postage. Sorry, you cannot vote by fax or email, you must send in the official ballot. If your copy of the Grid does not contain a ballot, please call the concil office (650 327-6622) and one will be mailed to you.

Oakland/East Bay Section

Vote to extend current term through December 31, 2000.

Chairman: Danh Lai

Danh is a senior member of the technical staff with SBC Technology Resources, Inc., in Pleasanton. He holds a BSEE, MSEE, and MBA, and is a Licensed Professional Engineer. He is a senior member of IEEE.

Vice Chairman: Kirti Shaw

Kirti Shaw is a principal engineer with Tosco Refinery at Avon Refinery. He holds BSEE and MSEE degrees, and is a Licensed Professional Engineer (CA). He has served in a number of positions with the OEB Section.

Secretary: Doug Snow

Doug Snow, PE is a project manager for the Major Project Group of WESCO Distribution, Inc. He has a BSEE from UCSD and is a Licensed Professional Engineer in California and Montana.

Treasurer: Annie Kong

Annie is an IT project manager for Chevron Information Technology Company. During her career she has been involved in managing radio microwave, VSAT, networking, and distributed computing projects. She holds a BSEE from California State Polytechnic University in San Luis Obispo.

PACE: Rosanna Lerma

Rosanna is engineering manager for the electrical department at Salas O'Brien Engineers in San Jose. Her BSEE is from the University of the Pacific. She is a member of OEB/IAS and OEB/PES. Her focus with PACE has been pre-college education activities, and in integrating the engineering societies in the Bay Area as vice president of SFBAEC

San Francisco Section

SF Section Elects Council Directors

In the San Francisco Section, the Council Directors are presently appointed by the Executive Committee in accordance with the Section bylaws. The San Francisco Section bylaws have recently been changed to comply with IEEE Regional Activities Board directives. One of the changes in the bylaws is the change from an academic year to a calendar year. Another change is the election of Council Directors instead of appointing them. The election of Council Directors will give San Francisco Section members more direct voice in the selection of Section and Council leadership and will enable the Section to comply with RAB guidelines regarding establishment of a quorum to conduct business.

The ballot included in this month's Grid includes the Council Directors in addition to the other positions traditionally up for election. The ballot lists all the present officers, present PACE Chair, present Section Director, and the present Council Directors. Your affirmative vote will extend the present terms of all these positions by six months to accommodate the transition to a calendar year. The positions will be open for ballot again at the end of this year for the 2001 term. We need your vote for continuity in Section operations. Please vote yes!

Section Chairman, Gary Fox

Chairman: Gary Fox

Gary is a systems engineer for GE Industrial systems. He received his BSEE from Cal Poly in San Luis Obispo, and has been an active electrical engineer for more than 20 years. He is a Registered Professional Engineer. Among his IEEE activities he served as chairman of SF/IAS in 1996-1997.

Vice Chairman: James Lekas

James Lekas is a software developer with TRW Financial Services and has been active in software development for some 20 years. He has been active in the IEEE Computer Society.

Secretary: Ray Halstead

Ray is an electrical engineer with the City of Oakland. He spent 20 years with PG&E and is a Registered Professional Engineer with a BSEE from SJSU and an MSEE from SCU. He has long been active with IEEE IAS on the chapter and Region 6 levels.

Treasurer: Julian Ajello

Julian is a supervisor in the Utilities Safety Branch of the Public Utilities Commission. During his career with the Commission, he has been involved with every aspect of electric utility regulation. He holds a BSEE from Cal Poly in San Luis Obispo and an MBA from Golden Gate University. He is a Registered Professional Engineer and a senior member of IEEE.

PACE: Pauline Tapia

Council Director: George Puffett

Council Director: Charles Sayle

Santa Clara Valley Section

Here are the nominated candidates for the term beginning July 1, 200. The ballot allows you to vote for each candidate or there are spaces for write-in candidates.

Chairman: Mahbub Khan

Mahbub is a senior technologist at Applied Materials in Santa Clara. He has previously worked for IBM and Seagate. Mahbub has a PhD in physics. He has been an active member of IEEE for 15 years, and has served as the chairman of the SCV Magnetics Society. Mahbub is currently the SCV Section vice chairman.

Vice Chairman: Jonathan David

Jonathan is a principle engineer for Cadence Design Systems' Methodology Services Group. He has a BSEE from Oregon State and an MSEE from the University of Maryland. He served as chairman of the SCV/SSC chapter from its founding in 1997, and continues to be active with them.

Treasurer: Ron Kane

Ron works for Tera Research in Sunnyvale. He has a BSEE from the University of Michigan, Ann Arbor, and an MSEE from Santa Clara University. An active IEEE member since his student days, he is a member of the SCV/SPS. He currently serves as the Section secretary.

Secretary: Rufino Olay

Rufino is a senior product marketing engineer at Xilinx, Inc., in the DSP Cores group. He has a BSEE from SJSU and has been an active member of IEEE for 7 years. Rufino has served as chairman of the SCV CPMT Society and is currently the SCV IEEE representative to the SCVEC.

PACE: Jack Nawrocki

Jack has been involved in IEEE-USA PACE since day one of its existence. He has served several previous terms as PACE chair of the Section as well as all the other elected offices and currently is membership chair. He also served as PACE chair for Region 6 for several years and now as Government Activities Chair.

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Instructor H. Jonathan Chao, Ph.D., is professor of electrical engineering at Polytechnic University, New York. His areas of research include terabit IP switches/routers, optical packet switches and quality of service control in IP/ATM networks.

Topics include B-ISDN transfer protocol, switch architecture designs, quality of service control, ATM signaling and private node interface protocols, LAN emulation, IP over ATM, multiprotocol label switching, differentiated services, resource reservation protocol and gigabit switch routers.

For a detailed brochure call 510 642-4151, e-mail course@unx.berkeley.edu or see www.unex.berkeley.edu/eng. For a free catalog listing 1,300 courses offered by UC Berkeley Extension this summer in locations around the Bay and beyond, call toll-free 1-888-UC-SMART (888-827-6278) or visit Extension's Web site at www.unex.berkeley.edu.

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Fabio Leite Visit . . .

from page 2

ITU is a United Nations-specialized agency in telecommunications and the highest telecom authority in the world.

If you or your company is interested in inviting him for further discussion on 3Gwireless and Beyond (4G), please contact me immediately to arrange the available slot. I can be reached by e-mail at wwlu@ieee.org or phone at 408 501-6591 or fax at 408 501-2403, attention: Dr. Willie LU, General Chair of 3Gwireless '2000.

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SCV/EMB

The Future Role of Telemanipulators and Telerobotics in Surgical Procedures

With the recent adoption of minimally invasive techniques, surgeons have been able to dramatically reduce the size of incisions and improve postoperative recovery. However, this transition in technique has required surgeons in a number of specialties to use long, awkward instruments that lack the precision, control, and ease of use of conventional tools. In attempting to extend the use of standard minimally invasive instrumentation into vascular surgery, it is clear that these tools lack the dexterity and precision necessary to be clinically useful.

The use of telemanipulators in surgery offers the ability to return to instinctive control, precision and dexterity to minimally invasive technique by electronic translation of surgeon movement from outside the body to inside the body. Telemanipulation allows the surgeon to use open surgical technique in a minimally invasive format while electronically enhancing his or her movements for greater accuracy.

Development of telemanipulators that provide maximum clinical utility involves the integration of mechanical, electrical and software engineering to translate instinctive surgical hand movements at a console to similar movements at the tip of an instrument driven by servo-motors. Intuitive Surgical Inc., in the past four years, has developed a telesurgical system, which attempts to deliver this capability to the mainstream of surgical practice. To date, a seven-degree of freedom master/slave telemanipulation system has been developed, which can very efficiently suture small vascular structures as well as accomplish fine dissection and tissue manipulation. Human clinical experience has been extensive, with procedures performed in cardiac, general gynecological, urologic, and vascular surgery. Intuitive has shipped more than twenty-five systems worldwide and robotic surgery has become the standard of care in a number of hospitals.

Surgical telemanipulation is becoming a powerful new tool in the armamentarium of the surgeon and will have a major impact in enabling minimally invasive technique across surgical specialties.

Dr. Frederic H. Moll, a founder of Intuitive Surgical will describe this new technology at the May 17 meeting of the Santa Clara Valley Engineering in Medicine and Biology Society.

Dr. Mill has served as medical director since the company's formation in December of 1995. Intuitive Surgical is a manufacturer of computer-assisted robotic operating systems for minimally invasive surgery.

Prior to Intuitive, Dr. Moll was a founder of Origin Medsystems, where he served as medical director from 1989 to 1995. Origin is a manufacturer of minimally invasive surgical devices. The company was acquired by Eli Lilly in 1992, and is currently a division of the Guidant Corporation.

Prior to Origin, Dr. Moll was the founder of Endotherapeutics, a pioneering company in laparoscopic surgery. While at Endotherapeutics, Dr. Moll was the inventor of the disposable safety, a device that is now among the most commonly used instruments in surgery. Endotherapeutics was sold to U. S. Surgical in 1992.

Dr. Moll received a BA from the University of California, a MD from the University of Washington, and an MS in Management from the Stanford Business School. He is the author of numerous articles regarding new MIS techniques and holds more than 20 device patents in the field.

SF/IAS

Hybrid Lighting: Illuminating our Future

Currently light strikes the roof on a sunny day to light every room in a building. The problem is collecting the light, and then getting it where you want it to go.

Join the San Francisco Industry Applications Society on May 23 for a presentation given by [illegible], vice president of [illegible] Lighting Technologies and [illegible] Energy Systems. Mr. [illegible] will present a discussion regarding new lighting technologies.

[illegible] has over fifteen years in optical design and development for sensor and holographic optical element systems. He has spent the last five years developing [illegible] tracking systems for natural lighting fixtures. He is currently developing control systems that integrate electrical and natural lighting fixtures using [illegible] technology.

Please see the calendar for details.

[illegible]

Automated Power Exchange

Automated Power Exchange, Inc. (APX), [illegible] e-commerce exchange for wholesale electricity trading [illegible] alternative [illegible] market operations [illegible] billion [illegible] electricity market. APX is the only wholesale electricity exchange to [illegible] internet [illegible] management [illegible] and [illegible]

APX employs [illegible] market operations in the [illegible] more than [illegible] million [illegible] through APX exchanges since the company's launch. APX has [illegible] than [illegible] which [illegible] scheduled on the [illegible]

The Santa Clara Valley Industry Applications and Power Engineering Society will meet May [illegible] for a presentation and [illegible] by [illegible], vice president of APX, and [illegible] the [illegible] APX [illegible], for [illegible] wholesale and retail power and [illegible] markets.

Please see the calendar for details.

IEEE•USA

Message from the President

The H1-B Guest Worker Legislation

Why is the issue "H1-B Guest Worker Visa" important? And why is IEEE-USA taking a position on it?

By Morrill W. Buckley, Jr.

These are important and controversial questions and they deserve straight answers. In this—the first of a series of IEEE-USA President's Columns—on different topics, I will try to answer them for you.

First, the H1-B is a non-immigrant visa that allows foreign workers, mostly in high-tech fields, to live and work in the United States. Because the normal green card system does not work well, the H-1B has increasingly become the easiest option for would-be permanent immigrants. Yet it remains a temporary visa. So, the H1-B issue is critical in several ways.

First, it directly affects U.S. electrical, electronic, and computer engineers, programmers, and many other high-tech fields. Clearly, large numbers of new workers in technical fields have an impact on those who are already here working in the same areas. It is also a concern for students who will be graduating in this marketplace in the coming years. How could it be otherwise? We must also respect the opportunities for senior engineers, minorities, women, and the financially disadvantaged who would like to enter our profession.

Second — the conditions under which new high tech workers are admitted and allowed to remain in the United States affects the future of our profession,as well as our national economic and social well-being. Because the H1-B is a non-immigrant temporary visa, a policy based on the H1-B becomes an endless series of quick fixes to the permanent problem of renewing our profession in the United States. After all, the United States is a land of immigrants, not guest workers.

Immigration has benefited us enormously throughout our history, but the universal experience with guest worker programs is that they fail. In every case, large numbers intend to stay. So why don't we fix what's broken? The Ellis Island model for immigration worked well.

The IEEE-USA was organized to be the career services and public policy arm for the 230,000 U.S. members of the IEEE. When the members, volunteers, and IEEE-USA Board agree that a particular matter (whether it is pensions, pre-college education, or immigration policy) is worth it, on behalf of the U.S. members, we make the effort. The H1-B is such an issue. As engineers, we know the best solution is the one that solves all the problems. What are the problems the H1-B visa is supposed to solve?

Employers want to hire skilled workers from the global marketplace. The H1-B workers they hire overwhelmingly want permanent residency — the green card — and U.S. high tech workers want two things: (1) that they compete equally with foreign born workers, and (2) that they continually improve their skills for a life time career in their profession. The IEEE-USA has simply put all of this together. "Green cards, not guestworkers" is an alternative that provides employers, H1-B workers and U.S. workers alike with what we all want.

For more information, go to: www.ieeeusa.org/grassroots/immreform/index.html

"That was a splendid idea, Engineer [illegible], thanks for having it for me."